REMARKS

I. INTRODUCTION

In response to the Office Action dated July 30, 2002, claims 1-3, 5-6, 10-13, 15-16, 20-21 and 23-24 have been cancelled, and claims 4, 7-9, 14, 17-19, 22 and 25-27 have been amended. Claims 4, 7-9, 14, 17-19, 22 and 25-27 remain in the application. Entry of these amendments, and re-consideration of the application, as amended, is requested.

II. PRIOR ART REJECTIONS

A. The Office Action Rejections

On page (1) of the Office Action, claims 1-6, 10-16, and 20-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takeda, U.S. Patent No. 6,166,718 (Takeda) in view of Frasier et al., U.S. Patent No. 5,268,677 (Frasier) and further in view of Lumelsky et al., U.S. Patent No. 5,162,779 (Lumelsky). On page (4) of the Office Action, claims 8, 9, 18, 19, 26, and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takeda in view of Frasier, further in view of Lumelsky, and further in view of Caddy, U.S. Patent No. 4,578,766 (Caddy). However, on page (5) of the Office Action, claims 7, 17, and 25 were indicated as being allowable if rewritten in independent form to include the base claim and any intervening claims.

Applicant's attorney acknowledges the indication of allowable claims, but respectfully traverses the rejections.

B. The Applicant's Claimed Invention

Independent claims 4, 7-9, 14, 17-19, 22 and 25-27 are generally directed to providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system. A two-dimensional viewport of the three-dimensional space is displayed on a monitor attached to the computer. A cursor is moved through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer. A position of the cursor is determined within the three-dimensional space relative to the two-dimensional viewport. A visual representation of the cursor is generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the visual representations differ among independent claims 4, 7-9, 14, 17-19, 22 and 25-27, as described in more detail below.

With regard to independent claims 4, 14 and 22, these claims recite that the generating step or means comprises a step of or means for varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to independent claims 7, 17 and 25, these claims recite that the generating step or means comprises a step of or means for adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to independent claims 8, 18 and 26, these claims recite that the generating step or means comprises a step of or means for adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

With regard to independent claims 9, 19 and 27, these claims recite that the generating step or means comprises a step of or means for adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

C. The Takeda Reference

Takeda describes a video game system with a vertical array of cursor images. The cursor is displayed in a three-dimensionally displayed field as a plurality of cursor images three-dimensionally in a vertical array in the field. A plurality of different types of cursor images may be prepared as each of said cursor images, and displayed as each of said cursor images. Positions where at least selected ones of the cursor images are displayed may be changed in every predetermined period of time. The cursor images may be changed in shape as a viewpoint with respect to the field is changed in position.

D. The Frasier Reference

Frasier describes a reduced viewport feature for a graphics display system that allows an operator to observe manipulations on a graphics display of video image planes that are wholly or partially outside a viewing area. A two-dimensional input image plane in the form of a wireframe is transformed to a three-dimensional image plane due to manipulation, such as rotation and/or translation. The resulting three-dimensional image plane is subsequently mapped as a two-dimensional projection onto the graphics display. Transformation matrix coefficients are multiplied

by a variable reduction coefficient to cause all points of the image plane to converge toward the center of the graphics display, resulting in the ability to view space which originally was not visible to the operator on an output video monitor.

E. The Lumelsky Reference

Lumelsky describes a stereoscopic cursor for a high-resolution stereoscopic raster display that is addressable to any arbitrary point on the display and simulates depth by alternately displaying left and right patterns that are offset from one another in a horizontal (x-axis) direction. Left and right views of the cursor are alternately displayed at the display frame rate, while a shutter mechanism presents the appropriate views to the viewer's eyes. To further enhance the perception of depth, monoscopic depth cues are provided by varying the cursor's color, size, transparency and/or pattern as the cursor moves in depth.

F. The Caddy Reference

Caddy describes a computer-aided process for automatically generating a camera-ready hardcopy of a graphical plot upon command instructions inputted via a conventional storage tube graphics display terminal having an addressable cross-hair cursor and a keyboard. In accordance with an interactive graphics code or program, tabular data coordinates stored in computer file form are retrieved and plotted on appropriately titled and scaled axes with the plotted coordinates being interconnected along curves formed of a smooth or linear nature by interpolation. The graphical plot viewed on the display terminal is further enhanced by inclusion of labels, shaded areas, and reference symbols and characters prior to printing out the hardcopy of an associated hardcopy unit coupled to the display terminal.

G. Applicant's Claims Are Patentable Over The Reference

Applicant's claims are patentable over the references because they recite a novel and nonobvious combination of steps and elements. More specifically, the cited references do not teach or suggest the various visual representations of the cursor that are generated to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

The Office Action cites the combination of Takada, Frasier, Lumelsky and Caddy against the Applicant's claims. Specifically, Takada is cited as teaching the displaying, moving and determining elements, Frasier is cited as teaching the two-dimensional viewport of the three-dimensional space,

Lumelsky is cited as teaching generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, and Caddy is cited for the use of projection lines and tag-along characters.

Applicant's attorney disagrees. Even when combined, the references do not teach or suggest the combination of elements shown in Applicant's independent claims 4, 7-9, 14, 17-19, 22 and 25-27.

For example, Lumelsky describes enhancing the perception of depth by providing monoscopic depth cues by varying the cursor's color, size, transparency and/or pattern as the cursor moves in depth. However, Lumelsky says nothing indicating the position of the cursor within the three-dimensional space relative to the two-dimensional viewport by varying a reflectivity of the cursor, adding and subtracting concentric circles about the cursor, adding and subtracting projection lines to the cursor, or adding and subtracting tag along characters to the cursor.

Further, although Caddy was cited for the use of projection lines and tag-along characters, it includes no such teaching in conjunction with cursors, especially to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport. With regards to the Office Action's assertion that cross-hair cursors are projection lines added and subtracted to cursors, and labels, shaded areas, reference symbols and characters are tag along characters added and subtracted to cursors, this assertion misinterprets both the Applicant's claims as well as the description in Caddy.

Projection lines are defined in Applicant's specification at page 9, line 17 et seq., and are shown in FIG. 4B. Projections lines, as defined, cannot be construed as cross-hairs. Moreover, Caddy does not add or subtract projection lines to the cursor.

Similarly, tag along characters are defined in Applicant's specification at page 9, line 21 et seq. and are shown in FIG. 4C. Tag along characters, as defined, cannot be construed as mere labels, shaded areas, reference symbols and characters. Moreover, Caddy does not add or subtract labels, shaded areas, reference symbols and characters to the cursor.

Thus, Applicant's attorney submits that independent claims 4, 7-9, 14, 17-19, 22 and 25-27 are allowable over the cited references.

III. CONCLUSION

In view of the above, it is submitted that this application is now in good order for allowance and such allowance is respectfully solicited.

Should the Examiner believe minor matters still remain that can be resolved in a telephone interview, the Examiner is urged to call Applicant's undersigned attorney.

Respectfully submitted,

GATES & COOPER LLP
Attorneys for Applicant

Howard Hughes Center
6701 Center Drive West, Suite 1050
Los Angeles, California 90045
(310) 641-8797

Date: September 30, 2002

By: _____
Name: George H. Gates
Reg. No.: 33,500

GHG/sjm/amb

APPENDIX: VERSION WITH MARKINGS TO SHOW CHANGES MADE

4. (AMENDED) [The] A computer-implemented method [of claim 1] for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

7. (AMENDED) [The] A computer-implemented method [of claim 6] for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

8. (AMENDED) [The] A computer-implemented method [of claim 6] for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

9. (AMENDED) [The] A computer-implemented method [of claim 6] for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

14. (AMENDED) [The] A computer-implemented graphics system [of claim 10] for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

17. (AMENDED) [The] A computer-implemented graphics system [of claim 16] for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

18. (AMENDED) [The] A computer-implemented graphics system [of claim 16] for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

19. (AMENDED) [The] A computer-implemented graphics system [of claim 16] for providing visual clues for navigating a three-dimensional space, comprising:

(a) a computer having a monitor attached thereto;

(b) means, performed by the computer, for displaying a two-dimensional viewport of the three-dimensional space on the monitor attached to the computer;

(c) means, performed by the computer, for moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(d) means, performed by the computer, for determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(e) means, performed by the computer, for generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the means for generating comprises means for adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

22. (AMENDED) [The] An article of manufacture [of claim 11] embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises varying a reflectivity of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

25. (AMENDED) [The] An article of manufacture [of claim 24] embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting concentric circles about the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

26. (AMENDED) [The] An article of manufacture [of claim 24] embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting projection lines to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.

27. (AMENDED) [The] An article of manufacture [of claim 24] embodying logic for performing a method for providing visual clues for navigating a three-dimensional space represented in a computer-implemented graphics system, the method comprising:

(a) displaying a two-dimensional viewport of the three-dimensional space on a monitor attached to the computer;

(b) moving a cursor through the two-dimensional viewport of the three-dimensional space according to a position of an input device attached to the computer;

(c) determining a position of the cursor within the three-dimensional space relative to the two-dimensional viewport; and

(d) generating a visual representation of the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport, wherein the generating step comprises adding and subtracting tag along characters to the cursor to indicate the position of the cursor within the three-dimensional space relative to the two-dimensional viewport.